Australian Bureau of Statistics

FOOTY STATS

FACILITATOR GUIDE

What is the 'Footy Stats' Program?

The 'Footy Stats' program provides a fun and interesting introduction to statistics for young Australians, with an emphasis on our Indigenous youth. The program uses football as a way to develop the ability of participants to understand and use statistical information through participation in a range of football activities and games. Although Australian Rules Football forms the basis of the activities, the conceptual basis of the program would be relevant across a range of sporting codes that involve the use of a ball.

What are the Benefits from the Footy Stats Program?

Literacy and numeracy are the vital foundation skills young children need to fully participate in Australian society after completing their education. Key learnings from Indigenous child enrichment programs in Australia indicate that those programs that focus on a child's strengths have more success in developing social, literacy and numeracy skills. The Australian Bureau of Statistics (ABS) and Australian Football League (AFL) have entered into a partnership to use football to improve the statistical literacy of young Australians.

The program uses football to get young people involved in educational activities which will improve their ability to make sense of statistics. By taking part in a range of football activities and games while collecting data on various football fundamentals (such as kicking, handballing, marking...), young Australians will learn to:

- think critically about information
- understand basic statistical concepts
- collect and analyse data
- communicate data (through simple graphs and tables), and
- interpret data

Why has the ABS developed Footy Stats?

As Australia's national statistics agency, the ABS is committed to developing the ability of all Australians to understand and make better use of data. The ABS initially developed the Footy Stats activities as part of their commitment to help advance the outcomes for Australia's Indigenous population through building statistical literacy, improving the quality and relevance of official Indigenous statistics, and enhancing ABS engagement with Indigenous communities. Although these activities were initially developed for Indigenous youth, the program is suitable for developing the statistical literacy of the wider Australian community.

What will I be doing as a Facilitator?

As the facilitator, you will use the activity sheets and supporting material to guide the participants to undertake each of the different steps in the activities, including guiding the discussions about what they have learnt. You do not have to be an 'expert' in statistics or maths as the relevant reference material (Glossary of Statistical Terms, etc.) has been included. The program is all about applying basic statistical concepts to football activities in an interesting and engaging way.

What are the Activities?

The Footy Stats Program contains six different activities designed to help the participants to understand some basic statistical concepts. Each of the activities is based on the basic statistical competencies at three different levels (See: Index of Activities – Key). This requires the participant to take part in football related activities, such as kicking or handballing, and discussions about their favourite AFL team or player. As a part of each activity, questions about what the participants have learnt have been included to help you facilitate the discussion. Where relevant, information has also been provided for you about the type of topics/responses that should be covered in the discussions.

Resource Materials

Attached you will find a range of printable materials for use in some or all of the activities. You will need to print off sufficient copies for your use. Also included is a Glossary which provides descriptions of the statistical concepts learnt in the activities.

The Activity Sheets for each of the six activities are available from the ABS website (www.abs.gov.au/footystats).

In order to undertake the football activities you need to have access to resources such as footballs, paper and markers, and an open area to participate in football activities and discussions. Each Activity Sheet describes the resources you will need for that activity.

Electronic equipment is not required to undertake the activities. However, an instructional Video featuring a demonstration of each activity is available on the ABS website for your reference.

Activity Extensions for Further Exploration of Statistical Concepts

The extension activity included within each Activity Sheet provides an opportunity to reinforce and build on the statistical concepts explored through the main activity. The extension acts as a transition between levels of complexity designed to challenge participants for the continued progression of their statistical learning.

Extension activities are optional, yet highly recommended. Facilitators may choose to implement the main activity and extension within one experience, or consecutively as two Footy Stats sessions.

Further Information

For any queries on accessing the Footy Stats program material or to provide any comments on the program, contact the Statistical Literacy Unit: email **statistical.literacy@abs.gov.au**

For all other ABS statistical inquiries please contact the National Information and Referral Service on **1300 135 070.**

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INDEX OF ACTIVITIES

LEARNING EXPERIENCES TO DISCOVER STATISTICS THROUGH FOOTBALL

KEY STATISTICAL LEARNING OUTCOMES : FOCUS ON COLLECTING, ANALYSING AND INTERPRETING DATA TO MAKE INFORMED DECISIONS

No	TITLE	FOCUS	SUMMARY OF ACTIVITY	LEVEL
1.	**In Footy Mode**	Investigating and representing data to identify mode	Conduct a simple survey of AFL club popularity within the group. Present your findings as a graph, and introduce statistical concepts such as mode.	🏉
2.	**Keeping Score**	Collecting skills data through participation in handball drills	Collect data while participating in a handball drill and recording results in a table. Use the data to construct a pie graph to show personal performance to inform football skills development.	🏉
3.	**Team Colours**	Investigating frequency and mode in relation to the AFL team colours	Collect data to create a simple graph showing the frequency of each colour used to represent one or more AFL clubs. Begin to interpret data from the graph to identify the colour most used by AFL teams.	🏉🏉
4.	**A Graphic Sports Report**	Producing and comparing graphs as evidence to report group goal kicking statistics	Spilt group into two teams to practise goal kicking and record team and individual scores. In small groups, identify and construct a suitable graph as evidence to answer investigation questions and support findings.	🏉🏉
5.	**Player Review**	Constructing and interpreting graphs that represent performance over time for three footballers	Construct a graph representing the performance of three fictional football players using data provided. Interpret the graph to measure and compare performance between players and trends in the performance of each player over time.	🏉🏉
6.	**If the AFL were only 100 players…**	Estimating the percentage of Indigenous footballers in a fictional AFL population of 100 players from data about a sample	Use data provided about a sample of a fictional AFL population of 100 players to calculate the percentage of AFL players in the sample who are Indigenous. Use the statistics about the sample to estimate the percentage of players who are Indigenous in the population.	🏉🏉🏉

KEY

1 Football: Discovering Statistics (Level 1)	2 Footballs: Exploring Statistics (Level 2)	3 Footballs: Establishing Statistics (Level 3)
🏉	🏉 🏉	🏉 🏉 🏉
Ideal as an introduction activity for beginners in statistics	Suitable for participants with some data skills and a basic understanding of statistics	Intended for participants experienced in collecting, representing, and interpreting data

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STATISTICAL COMPETENCIES

Conceptual understanding of statistics involves the development of data awareness, and comprehension of statistical language. Statistical capability is the ability to analyse, interpret, and evaluate statistics, and to communicate statistical information and understandings.

BASIC

Data representation

Collect and record data in tallies using simple questions. Represent data using tables, graphs (bar and column), where each value represents one observation.

Data investigation

Solve problems by collecting data and answering questions about obvious attributes of themselves and familiar objects and events.

Data interpretation

Read and make connections between lists, tables and graphs showing data from familiar contexts, and explain interpretations.

INTERMEDIATE

Data representation

Construct, read, interpret, and make connections between tables and simple graphs. Use and compare the effectiveness of a range of data representations for specific purposes.

Data investigation

Investigate data-oriented questions about familiar situations: planning and undertaking surveys, and predict what the data might show. This may include solving problems involving the collection of data over time. Carry out the investigation, represent the data, report the results, and begin to justify conclusions about relationships between the variables.

Summary statistics

Identify the mode and median in lists and in graphs.

ADVANCED

Data measures

Determine mean and median and use these measures as evidence to compare datasets.

Statistical measures

Use a mean or median from a sample to estimate the mean or median of a population and to recognise the limitations of samples.

Relative frequency

Calculate relative frequencies, and recognise variation between datasets.

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GLOSSARY OF STATISTICAL TERMS USED IN THE FOOTY STATS PROGRAM

TERM	DEFINITION
Analysis	Data **analysis** is the process of using collected data to understand events. ***Example:*** Coaches **analyse** data about the skills of their players to compare individual strengths and weaknesses to make decisions about who plays in each position.
Census	A **census** is a count for a whole population. ***Example:*** When you collect data about every player in a team you are taking a **census** of that team.
Data	**Data** are observations that can be analysed to give information. ***Example:*** In football, **data** may be the total number of goals kicked; or the number of supporters of an AFL club.
Data collection	**Data collection** is the process of gathering data. ***Example:*** The recording of all goals and behinds covered during a game is a part of **data collection**.
Data item	A **data item** is a value or characteristic which is measured or counted. It is sometimes called a **variable** because the characteristic may vary between data units and/or over time. ***Example:*** **Data items** in football may be player heights; favourite clubs; games played; or team colours.
Dataset	A **dataset** is a complete collection of all observations. ***Example:*** All data collected about the performance of a player for a season forms a **dataset**.
Estimate	An **estimate** is a statistic about a population that is based on data collected about a sample of that population. ***Example:*** If in a sample of 20 AFL players, 1 player is over 2 metres tall, it may be **estimated** that in a population of 100 AFL players, 5 players are over 2 metres tall.
Evidence	**Evidence** is information that helps or supports a conclusion or judgment. Statistics are one form of evidence. ***Example:*** A coach may use player stats or past round results as **evidence** to make decisions about the game plan for the next round.
Graph	A **graph** is an image that represents data visually. Types of graphs include bar charts, line graphs, pie charts.
Information	**Information** about something or someone can be shown by data that can help us make informed decisions. ***Example:*** AFL commentators may use game data to give supporters **information** about their AFL club.
Interpretation	**Interpretation** is a process of assigning meaning to the collected information and making conclusions. ***Example:*** Clubs may **interpret** the data they have collected over a season to make decisions about players for the next season.
Mean	The **mean** (more commonly known as **average**) is the combined value of all observations in a dataset divided by the number of observations. ***Example:*** Mike Goaler kicks 1, 2, 1, 6, 1, 2, 1, 1, 3 goals over 9 rounds of football. The **mean** number of goals kicked by Mike per game is 2 (because 1 + 2 +1 + 6 + 1 + 2 + 1 + 1 + 3 = 18; 18 divided 9 = 2).
Median	The **median** is the number that is larger than half of the values and smaller than half of the values. The **median** gives an idea of the central values of the dataset. ***Example:*** Mike Goaler kicks 1, 2, 1, 6, 1, 2, 1, 1, 3 goals over 9 rounds of football. The **median** number of goals kicked by Mike is 1 (because when the dataset is ordered 1, 1, 1, 1, 1, 2, 2, 3, 6 the middle value is 1 as there are an equal number of values on each side of the median value).
Mode	The **mode** is the most frequent or commonly observed value in a dataset. ***Example:*** Mike Goaler kicks 1, 2, 1, 6, 1, 2, 1, 1, 3 goals over 9 rounds of football. The **mode** number of goals kicked by Mike in a game is 1 (because 1 appears more times in the dataset than any other value).
Percentage	A **percentage** is the term used to express a number as a fraction of one hundred. A percentage is often symbolised using the sign %. ***Example:*** A score of 3 out of 5 handballs through the target can be expressed as 60% (because 3 divided by 5 multiplied by 100 = 60).
Population	A **population** is any complete group with at least one characteristic in common. Population units may be people, objects, or events such as, motor vehicles, people living in Australia, or AFL players. ***Example:*** If you want statistics about all players in the AFL, then the **population** is every player in the AFL.
Ratio	A **ratio** is a way of showing the relationship between two values or characteristics. ***Example:*** If a team scores 5 behinds for every goal kicked the **ratio** of behinds scored compared to goals kicked is 5:1 (i.e. 5 behinds: 1 *goal*).

Sample	A **sample** is a subset of units in a population, selected to represent all units in a population of interest. ***Example:*** When you collect data about 20 AFL players to study the population of AFL players, you are taking a **sample** of that population.
Statistics	**Statistics** are summary or descriptive values that have been produced from a data collection. ***Example:*** Player **statistics** can tell you about the number of goals he has kicked in his career; the number of years he has played in the AFL; and/or the number of clubs for which he has played.
Survey	A **survey** is the collection of data from a given population for the purpose of analysis of a particular issue. Data are often collected from a sample of a population, and this is known as a sample survey. ***Example:*** A **survey** of the supporters of AFL teams about the number of games they attend each season.
Table	A **table** shows data organised in rows and columns.
Trend	The **trend** describes patterns in data that have been collected over time. ***Example:*** Adam Passer's performance over 6 rounds (6 goals, 5 goals, 4 goals, 3 goals, 2 goals, 1 goal) shows a pattern of a downward **trend** because he kicked one less goal each round.

This glossary is specific to the Footy Stats program. For ABS definitions of statistical terms and further information about concepts please visit: **http://www.abs.gov.au/statlanguage**

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AFL Footy Clubs and Colours

Adelaide Crows

Blue
Red
Gold

Brisbane Lions

Navy
Maroon
Gold

Carlton Blues

Navy
White

Collingwood Magpies

Black
White

Essendon Bombers

Black
Red

Fremantle Dockers

Purple
White

Geelong Cats

Blue
White

Gold Coast Suns

Red
Gold

Greater Western Sydney Giants

Orange
White
Charcoal

Hawthorn Hawks

Brown
Gold

Melbourne Demons

Red
Blue

North Melbourne Kangaroos

Blue
White

Port Adelaide Power

Teal
White
Black

Richmond Tigers

Yellow
Black

St Kilda Saints

Red
White
Black

Sydney Swans

Red
White

West Coast Eagles

Blue
White
Yellow

Western Bulldogs

Red
White
Blue

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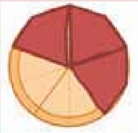
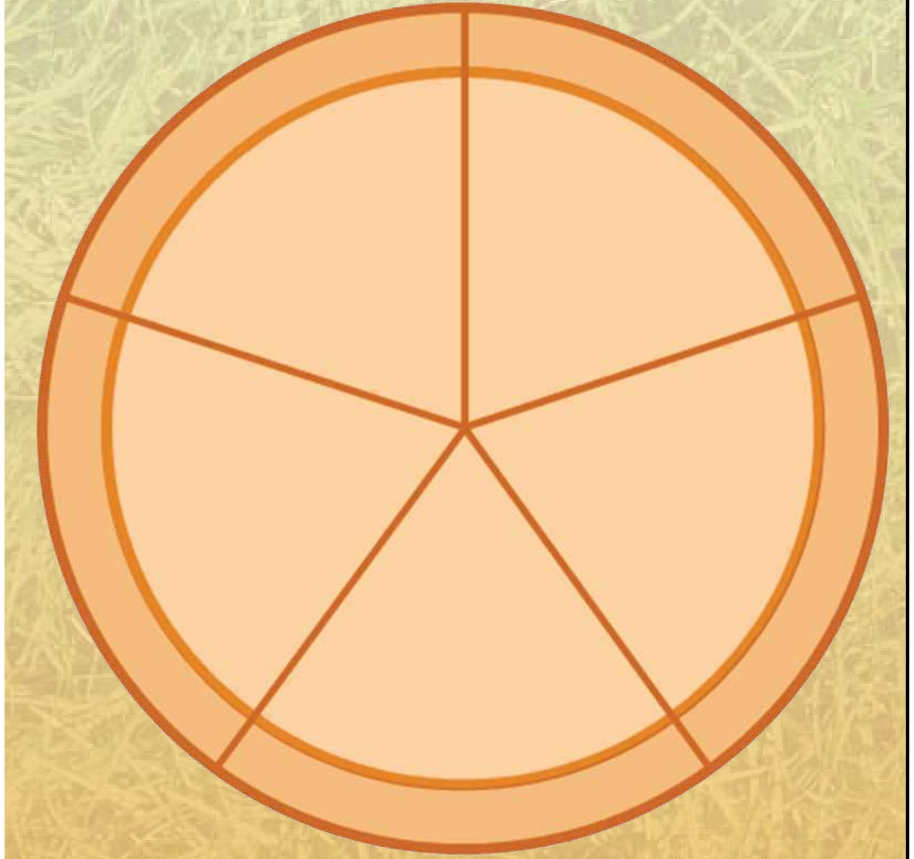
Pie and Sauce Graph

Show your collected handball drill data in the **Pie *and Sauce* Graph** using your **Footy Stats Table**. Your pie is divided into **5** equal slices.

1. Read your **Footy Stats Table** data.
2. Spread sauce on **1** slice of pie for each footy you handballed through the target.



Here is an example: *If 3 of your 5 handballs went through the target, spread 'sauce' on 3 slices of the pie.*



3. Let's look at your **Footy Stats!**

I scored ___ **out of 5** handballs.

This can be written as: $\frac{\quad}{5}$

Another common way to express a score is as a ***percentage***.

A ***percentage*** (%) is a number out of 100 representing a fraction of a whole.

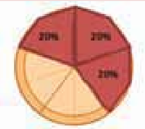
The whole pie is worth 100%.

Our pie is cut into 5 equal pieces. Each piece is worth 20% of the pie. So **20% + 20% + 20% + 20% + 20% = 100%**

So for each handball through the target, you get *20%* of the pie.

If you add each piece of your 'sauced' pie you will get your ***percentage***.

Here is an example:
I scored 3 out of 5 handballs through the target.



20% (1st piece)
+ 20% (2nd piece)
+ 20% (3rd piece)
60%

The percentage of my handball attempts through the target was 60%.

What is your ***percentage***?

My ***percentage*** of handballs through the target was ____.

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Data Representations Guide

Hypothetical Data: Player Scores and Graphs

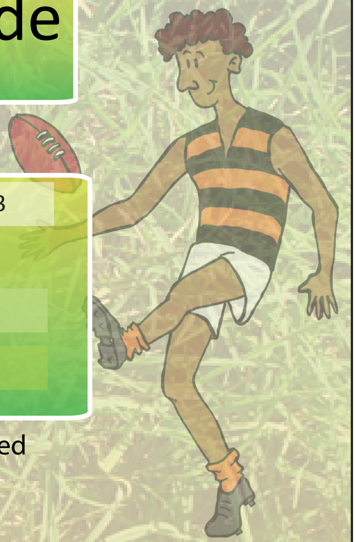
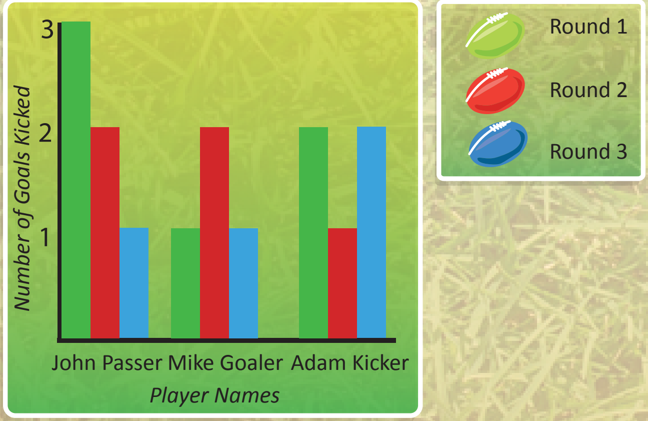


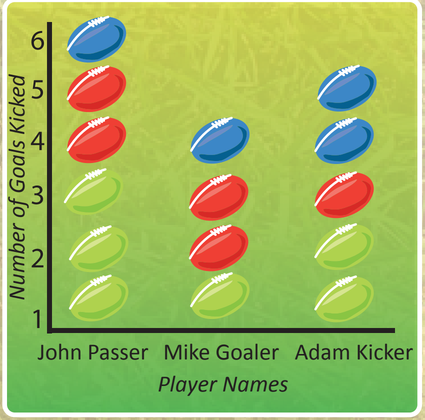
Table of Data

	Round 1	Round 2	Round 3
John Passer	3	2	1
Mike Goaler	1	2	1
Adam Kicker	2	1	2

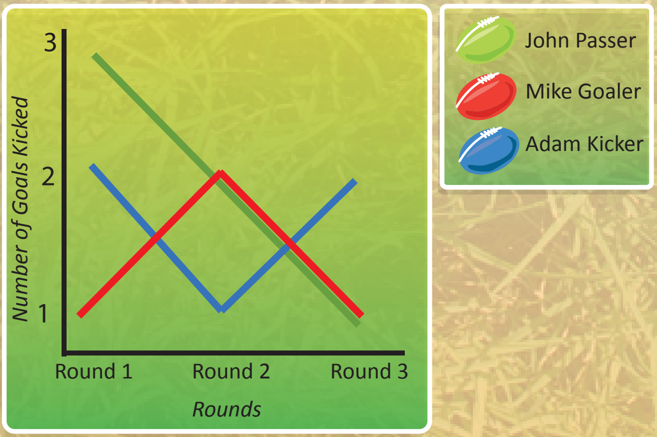
Below are examples of the different types of graphs, created using the above player data



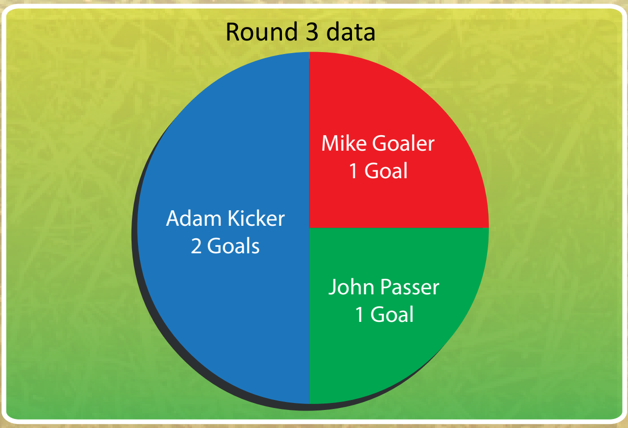
Column Graph



Picture Graph



Line Graph



Pie Graph

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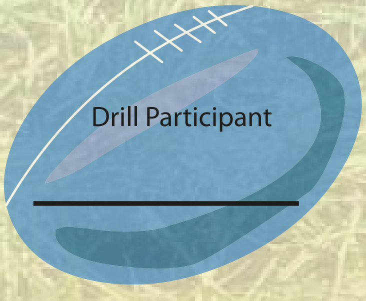
Footy Stats Table



Drill Participant ____________

Get a mate to record your stats in the table as you practise your footy skills

Data Collector ____________

My Footy Data

Skill	Drill	Number of handballs through the centre of the target out of 5
Handball	*Through the centre of a target*	____ out of 5